

Research note**Corrections in *Cotoneaster* (Rosaceae) in Taiwan**Kun-Cheng Chang,<sup>1)</sup> Kwo-Shang Lai,<sup>2)</sup> Fu-Yuan Lu,<sup>3)</sup> Chih-Chiang Wang<sup>4,5)</sup>**[ Summary ]**

In Taiwan, *Cotoneaster bullatus* Bois was treated as a new species, *Photinia kudo*i Masamune, and was identified as *C. konishii* Hayata. In this paper, we clarify the identity of *C. bullatus* Bois in the flora of Taiwan. Line drawings, color photos, and a taxonomic description are also provided in the paper. *Photinia kudo*i Masamune and *Pourthiaea kudo*i (Masamune) Masamune are designated as 2 new synonyms of *C. bullatus* Bois. This species, *C. bullatus* Bois, is similar to *C. konishii* Hayata, but they can be distinguished by the floweret number of the inflorescence and the shape of the leaves. *Cotoneaster bullatus* has biggish leaves (5~13 × 1.5~5.5 cm), the upper surface is conspicuously bullate, and the inflorescence is 7~21-flowered, which differ from these of *C. konishii* which has smaller leaves (1.3~5 × 1~3.5 cm), the upper surface is not bullate, and the inflorescence is 3~5-flowered (rarely ~7).

**Key words:** *Cotoneaster bullatus*, *Cotoneaster konishii*, Rosaceae, *Photinia kudo*i, *Pourthiaea kudo*i, Taiwan.

**Chang KC, Lai KS, Lu FY, Wang CC. 2009.** Corrections in *Cotoneaster* (Rosaceae) in Taiwan. Taiwan J For Sci 24(1):69-74.

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Received June 2008, Accepted January 2009. 2008年6月送審 2009年1月通過。

## 研究簡報

## 台灣產柃子屬(薔薇科)之新知見

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## 摘 要

泡葉柃子(*Cotoneaster bullatus* Bois)過去在台灣被鑑定為小西氏柃子(*C. konishii* Hayata)，甚至發表處理成工藤氏石楠(*Photinia kudoii* Masamune)或工藤氏老葉兒樹(*Pourthiaea kudoii* (Masamune) Masamune)。本文確認泡葉柃子產於台灣，並將*Photinia kudoii* Masamune及*Pourthiaea kudoii* (Masamune) Masamune處理為其新異名，文中並提供其分類處理、形態特徵描述、彩色照片及繪圖以供參考。在形態上本種近似小西氏柃子，但可由兩者的葉形及花序小花的數量區分之。泡葉柃子葉較大(5~13×1.5~5.5 cm)、葉面有明顯泡狀隆起及花序小花7~21朵，與小西氏柃子葉較小(1.3~5×1~3.5 cm)、葉面無泡狀隆起及花序小花3~5朵稀7朵可以區分。

關鍵詞：泡葉柃子、小西氏柃子、薔薇科、工藤氏石楠、工藤氏老葉兒樹、台灣。

張坤城、賴國祥、呂福原、王志強。2009。台灣產柃子屬(薔薇科)之新知見。台灣林業科學24(1):69-74。

The genus *Cotoneaster* Medik. (Maloi-deae: Rosaceae), with about 90 species, is widespread in temperate regions of Asia (except Japan), Europe, and North Africa (Yü and Lu 1974, Lu and Brach 2003). Hayata (1913) described *C. konishii* as a new species in Taiwan. Masamune (1933) described a new species, *Photinia kudoii* in the genus *Photinia* in Taiwan. Later, Masamune (1954) moved *Photinia kudoii* to the genus *Pourthiaea*. But Yü and Lu (1974) and Lu and Brach (2003) treated *P. kudoii* as a synonym of *P. beauverdiana* var. *notabilis*; Liu and Su (1977), Ohashi (1993) and Hsieh and Huang (1997) treated *P. kudoii* as a synonym of *C. konishii*. In the study, we reexamined these species and also made comparisons based on a literature review and some type specimens i.e., *C. bullata* var. *macrophyllus* (holotype (photo): A), *C. konishii* (holotype: TAI), and *P. kudoii* (holotype: TAI). The species *C. bullata* in Taiwan is first proposed. *Photinia kudoii* and

*Pourthiaea kudoii* are designated as 2 new synonyms of *C. bullata*.

***Cotoneaster bullatus*** Bois in Vilm. & Bois, Frutic. Vilm. 119. 2. f. 1904 & in Fedde, Repert. Sp. Nov. 3:228. 2. f. 1906; Schneid. Ill. Handb. Laubh. 1:747. 1906; Yu in Bull. Br. Mus. Bot. 1:133. 1954; Klotz in Wiss. Zeits. Univ. Halle 6: 951. 1957.

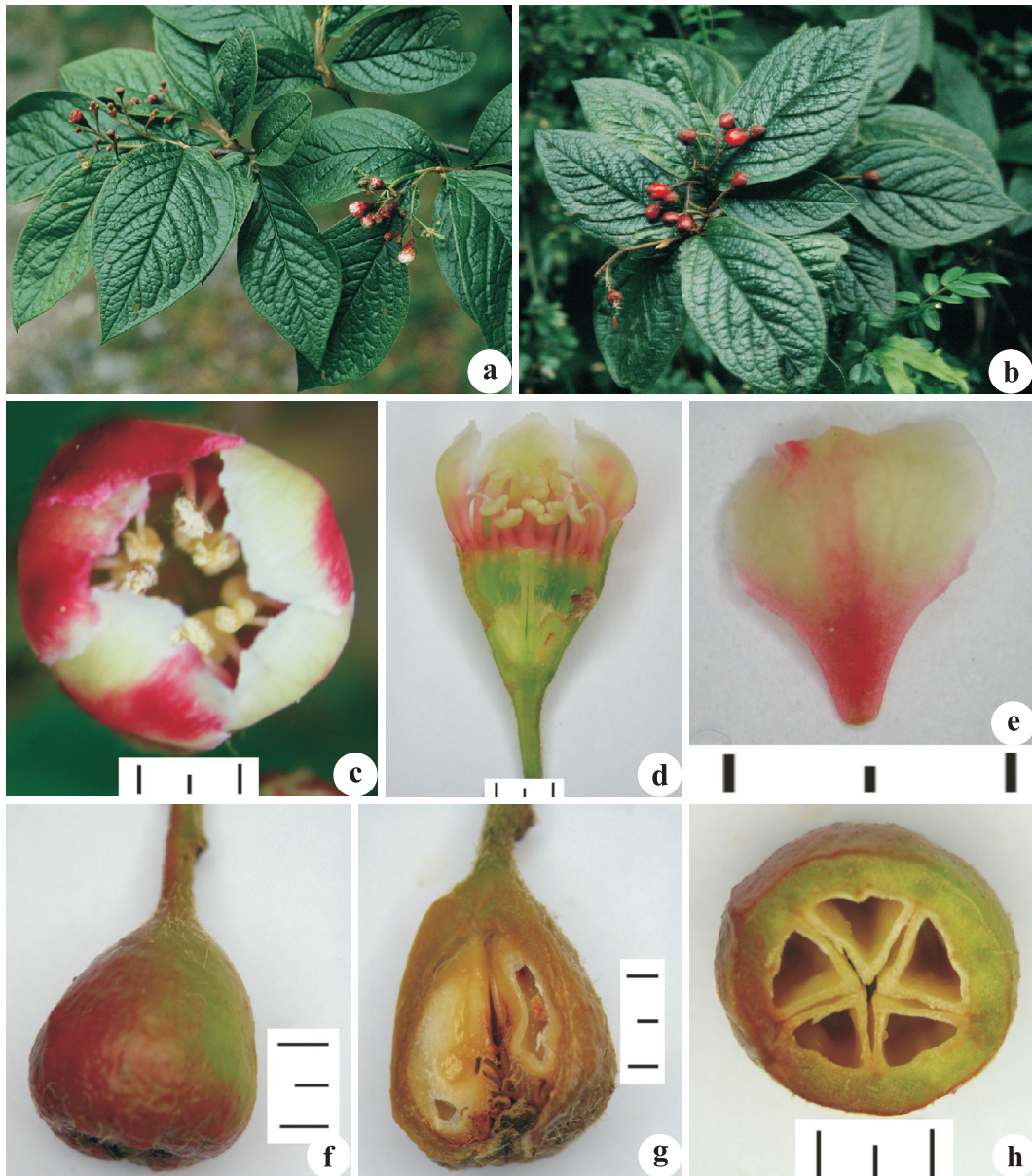
*Cotoneaster konishii* auct. non Hayata: Kanehira, Formosan Trees rev. ed. 258. f. 202. 1936. pro omnino; Li, Woody Flora Taiwan 270. 1963. pro parte; Liu & Su, Flora Taiwan 3:60. 1977. pro parte; Ohashi, Flora Taiwan 2nd. ed. 3:73. 1993. pro parte; Hsieh & Huang, Taiwania 42(1):48. 1997. pro parte. *Photinia beauverdiana* var. *notabilis* auct. non Rehd. & Wils.: Yü & Lu, Flora Reip. Pop. Sin. 36:244. 1974. pro *Photinia kudoii* cet. excl.; Lu & Brach, Flora China 9:131. 2003. pro *Photinia kudoii* cet. excl. *Photinia kudoii* Masamune, Trans. Nat. Hist. Soc. Formosa 23:206. 1933. syn. nov.

*Pourthiaea kudoi* (Masamune) Masamune,  
List Vasc. Plants Taiwan. 65. 1954. syn. nov.  
..... 泡葉梅子 Figs. 1, 2

Deciduous shrub or small tree, branchlets  
columnar, blackish-brown to grayish-black,  
with prominent lenticels, initially pilose.



Fig. 1. *Cotoneaster bullatus* Bois. a, habit; b, fruiting branch; c, flower; d, vertical-section of flower; e, petal; f, stamen; g, styles; h, pome; i, cross-section of pome. (scale: a, b = 3 cm; c-e, h, i = 2 mm; f, g = 1 mm).



**Fig. 2.** Photographs of *Cotoneaster bullatus* Bois. a, habit of flowering; b, habit of fruiting; c, flower; d, vertical section of flower; e, petal; f, pome; g, vertical section of pome; h, cross-section of pome. (scale: c-h = 2 mm).

Leaves chartaceous to subcoriaceous, oblongovate to elliptical, rhombic, oval, or lanceolate-oblong, 5~13 cm long, 1.5~5.5 cm wide; apex acute, acuminate, or apiculate, base cuneate to rounded or subcordate; upper surface

conspicuously rugose and bullate, initially pilose, more densely so along veins, subglabrous when old; lower surface densely pilose; veins in 7~12 pairs, net-veins prominently indented on upper surface and raised on lower

surface; petiole 3~7 mm, pilose; stipules lanceolate, 4~7 mm long. Corymbiform panicle or cymose panicle, 7~21-flowered, rachis and pedicels pilose; bract narrow-lanceolate, ca. 5.7 mm long, bractlet ca. 4 mm long; corolla 5.5~6.5 mm across. Hypanthium campanulate, exterior puberulent; sepals triangular, margin puberulent, ca. 1 mm long, ca. 1.5 mm wide. Petals 5, erect, red, pinkish, and nearly white, obovate to nearly round, apex rounded, cuspidate, or erose, 3.5~5.3 mm long, 2.6~4.2 mm wide; stamens (18~) 20, 2~3.5 mm long, aduncous, filaments pinkish, glabrous, anthers ovate, white; ovary 4 (or 5) cells, pubescent apically; styles 4 or 5, 1.8~2.4 mm long, free, glabrous. Fruits obovoid or globose, initially pilose, glabrous when old, red, 6~8 mm long, 4~9 mm across; pedicel 5~8 mm long; sepal persistent; pyrenes 4 or 5. Flowering during May to August, with fruit ripening from July to November.

Distribution and habitat: China (Hubei, Sichuan, Xizang, and Yunnan). Taiwan, in the northern and central parts of the island at elevations of 2500~3000 m. At forest margins or on exposed gravelly slopes.

Specimens examined: **Taichung**: Chiliehting, 17 July 1996, *T.-Y. Liu* 993 (TAIF, HAST); Mt. Shenmachen, 25 June 1994, *C.-M. Wang* w00962 (HAST, TNM). **Hualien**: Mt. Pilu, 25 July 1990, *H.-S. Lin* & *C.-K. Lin* s. n. (TNM); Pilu logging road, 19 July 1999, *C.-I. Huang* 378; 11 Oct. 2000, *J.-J. Chen et al.* 396 (HAST); Tayuling, 24 Sept. 1984, *C.-H. Ou* 7574 (TCF); 6 July 1995, *K.-C. Yang* s. n.; 11 Sept. 1995, *T.-T. Chen et al.* 7385 (TAIF); 4 July 2000, *Y.-P. Cheng* 3183 (TAIF, TNM); 12 July 2000, *C.-H. Lin* 495 (HAST); 7 Aug. 2003, *K.-C. Chang* 1548; 26 Oct. 2003, *K.-C. Chang* 2163; 17 May 2004, *D.-S. Lin* s. n.; 19 May 2004, *K.-C. Chang* 2455 (CHIA). **Nantou**: Mt. Chilai, 30 Sept. 1977, *Y.-C. Jeng* 1829 (TAI); Mt. Nenkao,

7 Aug. 1919, *E. Matsuda* 11665 & 11666; 3 Nov. 1996, *C.-C. Hsu* 58 (TAIF); 14 July 1930, *Kudo* & *Mori* 89 (*Photinia kudoi*, holotype: TAI!); Tienchin, 12 Aug. 1986, *S.-Y. Lu* 19749; 4 Oct. 1998, *C.-K. Liu* 1057 (TAIF); 7 Sept. 2001, *T. Y. A. Yang* 13927 (TNM).

Note: In Taiwan, *C. bullatus* was earliest treated as the new species, *P. kudoi*, by Masamune in 1933. Later, *C. bullatus* was identified as *C. konishii* by Kanehira in 1936. This wrong opinion was accepted by some authors such as Liu and Su (1977), Ohashi (1993), and Hsieh and Huang (1997). Moreover, Yü and Lu (1974) and Lu and Brach (2003) treated *P. kudoi* as a synonym of *P. beauverdiana* var. *notabilis*; while Liu and Su (1977), Ohashi (1993), and Hsieh and Huang (1997) treated *P. kudoi* as a synonym of *C. konishii*. However, *C. bullatus* has an entire leaf margin and bony carpels when mature, which differ from *P. beauverdiana* var. *notabilis* which has a serrate leaf margin and leathery carpels when mature; so these 2 species can easily be distinguished. On a morphological basis, *C. bullatus* is similar to *C. konishii*. But they can be distinguished by the floweret number of the inflorescence and the shape of the leaves. *Cotoneaster bullatus* has biggish leaves (5~13 cm long, 1.5~5.5 cm wide), the upper surface is conspicuously bullate, and the inflorescence is 7~21-flowered, which differ from these of *C. konishii* which has smaller leaves (1.3~5 cm long, 1~3.5 cm wide), the upper surface is not bullate, and the inflorescence is 3~5-flowered (rarely ~7).

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